The Status of
Rock Dwelling Sedge
(Carex petricosa var. misandroides)
in Newfoundland and Labrador

THE SPECIES STATUS ADVISORY COMMITTEE
REPORT NO. 10

February 20, 2008
ASSESSMENT

<table>
<thead>
<tr>
<th>Assessment:</th>
<th>Current designation:</th>
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<tbody>
<tr>
<td>Endangered</td>
<td>None</td>
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</table>

**Criteria met:**
B2. Area of occupancy < 500 km², a) known to exist at < 5 locations, b) continuing decline observed in iii) quality of habitat,
C. Number of mature individuals <2,500, 2) continuing decline projected and inferred in numbers of mature individuals, a) fragmentation with i) no population estimated to contain >250 mature individuals, and
D1. Number of mature individuals <250

**Reasons for designation:**
Qualifies as "endangered" under the SSAC/COSEWIC criteria B2 (a) and (b) iii, C2 (a) i, and D1

- Area of occupancy excluding the historical locations < 0.1 km²
- Only 1 recently confirmed location and 4 historical locations
- Two of the historical locations have been subjected to continuing habitat loss and degradation
- Limestone habitats throughout the island are severely degraded due to anthropogenic effects
- Only 12 mature individuals at the recently confirmed location
- Rescue effect severely limited

The original version of this report was prepared by John E. Maunder on behalf of the Species Status Advisory Committee.
STATUS REPORT

Carex petricosa Dewey var. misandroides (Fernald) B. Boivin
Rock Dwelling Sedge, Man-hater Sedge; Fr. carex misandroïde

Synonyms:
- Carex misandroides Fernald [TYPE: Table Mountain, Port au Port, Newfoundland]
- Carex franklinii Boot in Hooker var. misandroides (Fernald) Raymond

Family: Cyperaceae (Sedges)
Life Form: Perennial sedge.

Distribution

Global:
- North America: Canada [see more detail below].

National:
- Newfoundland and Labrador (Newfoundland only), Québec (Ball and Zoladz, 1994).

Provincial:
- On the Island of Newfoundland, known only from 5 small west coast localities (Fig. 1).
Figure 1. Known localities for *Carex petricosa* var. *misandroides* in Newfoundland: [a] Cape St. George, [b] Table Mountain, [c] William Wheeler Point, [d] Woman Cove, [e] Shag Cliff, Bonne Bay. [All are historical as indicated by a triangle, except for “c”].

**Description**

A compact-to-slender, loosely tufted, rhizomatous, highly variable sedge, of limestone habitats.

**Habitat**

A plant of limestone barrens, cliffs, screees, taluses, and shores; 0-300 m (Ball and Zoladz 1994).

In Newfoundland, specifically, it occurs on dry to damp limestone cliffs, barrens, and tablelands, slippery slaty talus slopes, and upper parts of scree slopes just below the turfy zone at the base of high limestone cliffs; substrate of gravels, mixed with fine soils, over rubble or bedrock; sometimes found on mossy knolls,
with small isolated shrubs (including *Betula papyrifera*, *Dasiphora fruticosa* and *Juniperus communis*). Altitude to about 300 m.

**Overview of Biology**

Very little is known. Apparently mature spikes were evident at William Wheeler Point on July 21, 2000 (see photo on the cover of this report); and on Fernald’s original herbarium collection from Table Mountain, dated July 16-17, 1914. Perennial. Apparently clonal. Calciphile.

**Population Size and Area of Occupancy**

Unknown. Fernald (1915) stated that: “Only one knoll of *C. misandroides* was observed during a hurried trip across the tableland of Table Mountain” in 1914. Mackenzie and Griscom characterized the species as “rare and local” at Green Gardens [= Garden Hill], near Cape St. George, on July 18, 1922. There are no known historical population estimates or descriptions for either of: the Shag Cliff, Bonne Bay population; the William Wheeler Point, Bay of Islands population; or the Woman Cove, Bay of Islands population.

Estimating population size is particularly problematic. Despite recent directed attempts to relocate the several historical populations, there has been only one success, to date, at William Wheeler Point, where 12 individual plants were found by the Newfoundland Rare Plant Project team on July 21, 2000. Whether this lack of relocation success indicates a truly diminished Provincial population, and/or the result of the elusiveness of the species, is unknown.

**Traditional and Local Ecological Knowledge**

No published or other evidence has been found regarding the aboriginal use of *C. petricosa var. misandroides* in Newfoundland. In particular, a specific inquiry to the Federation of Newfoundland Indians in 2007 yielded no definitive information. Arnason *et al.* (1981) failed to mention any species of *Carex* in their comprehensive study of eastern Canada ethnobotany.
Trends

Population trends are unknown. The failure of recent workers to relocate four of the five historical populations, may, or may not, be an indication of a widespread population decline. On the other hand, there has been significant decline in area, extent and quality of limestone barren habitats at two of the historical location since the plants were last located. The TYPE locality at Table Mountain has seen the construction of a major post-war radar and communication facility. The Cape St. George locality has seen continuing development (road, oil exploration, recreational park and trails, commercial) and increased human activity.

Threats and Limiting Factors

Very small population size. Prone to stochastic (ie. random) events. The Table Mountain population, if it still exists, may be impacted by ongoing activities associated with several communications towers operated by a number of federal agencies. The Cape St. George population, if it still exists, may be particularly impacted by ongoing oil exploration activities. Development pressure for housing and tourism are ongoing.

Existing Protection

The population at Shag Cliff, Bonne Bay (if it still exists) is located within Gros Morne National Park.

Special Significance

A rare, disjunct variety. Table Mountain, Port au Port is the TYPE locality for Carex misandroides Fernald.

Collections Examined

Provincial Museum of Newfoundland and Labrador:
   One herbarium collection.

Agnes Marion Ayre Herbarium (Memorial University of Newfoundland):
   Two herbarium collections.
### Rank or Status

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<td>Québec General Status</td>
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[Note: Where available, ranking data from the biodiversity databases of the individual Provinces has been used. Otherwise, General Status ranks are based upon the “General Status of Species in Canada (2005)”, and S-Ranks are based upon “NatureServe Explorer”. Where there is apparent discrepancy, NatureServe Explorer ranks are considered to be the least current.]
Sources of Information and List of References


plants of Terra Nova National Park, Newfoundland. Contract #2242-96-0010 for Natural Resources Division, Parks Canada, Hull, Québec.


## TECHNICAL SUMMARY

<table>
<thead>
<tr>
<th>Distribution and Population Information</th>
<th>Criteria Assessment</th>
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<tbody>
<tr>
<td>Extent of occurrence (EO) (km²)</td>
<td>approximately 2710 km²; assuming that all historical populations are still extant; otherwise, &lt; 0.0001 km²</td>
</tr>
<tr>
<td>Area of occupancy (AO) (km²)</td>
<td>&lt; 0.0001 km² [William Wheeler Point only]; AOs of historical populations unknown</td>
</tr>
<tr>
<td>Number of extant locations</td>
<td>possibly 5; but, only one of these has been relocated within the last 25 years</td>
</tr>
<tr>
<td>Specify trend in # locations, EO, AO (decline, stable, increasing, unknown)</td>
<td>unknown; has not been relocated at 4 out of 5 historical locations despite targeted efforts</td>
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<tr>
<td>Habitat trend: specify declining, stable, increasing or unknown trend in area, extent or quality of habitat</td>
<td>unknown; 2 of the historical locations have experienced some decline in quality of habitat</td>
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<tr>
<td>Generation time (average age of parents in the population) (indicate years, months, days, etc.)</td>
<td>unknown; perennial</td>
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<tr>
<td>Number of mature individuals (capable of reproduction) in the Provincial population (or, specify a range of plausible values)</td>
<td>12 [William Wheeler Point only]</td>
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<td>Total population trend: specify declining, stable, increasing or unknown trend in number of mature individuals or number of populations</td>
<td>Unknown</td>
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<tr>
<td>Are there extreme fluctuations (&gt;1 order of magnitude) in number of mature individuals, number of locations, AO and/or EO?</td>
<td>Unknown</td>
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<tr>
<td>Is the total population severely fragmented (most individuals found within small and isolated populations)</td>
<td>Yes</td>
</tr>
</tbody>
</table>

### Rescue Effect (immigration from an outside source)

| Does species exist elsewhere?                                                    | Yes                                                                                                                                         |
| Status of the outside population(s)? [adjacent Provinces only]                  | Québec, may be at risk                                                                                                                       |
| Is immigration known or possible?                                               | Unlikely                                                                                                                                   |
| Would immigrants be adapted to survive here?                                    | Unknown                                                                                                                                   |
| Is there sufficient habitat for immigrants here?                                | Unknown                                                                                                                                   |
Appendix A. Population Information

Recently Verified Occurrences/Range Use (recorded within the last 25 years)
Verified occurrences consist of observations supported by the collection of a voucher specimen (i.e. a sample to be identified/confirmed by experts and deposited in a herbarium).

William Wheeler Point (Fig. A-1[bottom]):


July 21, 2000. William Wheeler Point, Goose Arm, Bay of Islands, scree slope. Upper part of scree slope below high limestone cliffs; vegetation cover 25%, dominated by Betula papyrifera, Dasiphora fruticosa and Juniperus communis; substrate limestone outcrops and strips of blocky material alternating with strips of gravel mixed with fine soil, dry to mesic with seepage; in open patch of gravel mixed with fine soil among rocks. Slope: 40°. Aspect: W. Elevation about 95 m. [Observers: N. Djan-Chékar, J. Maunder, L. Brouillet, and C. Wentzell. Collection: no specimens collected, by reason of plant rarity, but occurrence verified onsite by close observation and direct comparison with the single collection taken nearby on the same day.]

Recent Search Effort (areas searched within the last 25 years with estimate of effort)

General rare plant surveys of the west and northeast coasts of the Island were conducted by members of the Newfoundland Rare Plant Project (q.v.), specifically during 1999 to 2001, when 1645 individual sites were surveyed and 7622 plant collections were made. Additional general rare plant surveys have been conducted within the Province by various National Parks personnel, and by J. E. Maunder of the Provincial Museum and H. Mann of Sir Wilfred Grenfell College (early 1970's to present), as well as by N. Djan-Chékar of the Provincial Museum (2002 to present). Significant additional general collecting has been conducted, on the south coast of the Island, by R. Etcheberry, of St.-Pierre et Miquelon (1986, 1987, 1989, 1990, 1992, and 1993).

Targeted rare plant surveys were conducted by personnel from the Université de Montréal, during the course of the preparation of the publication “The Rare Vascular Plants of the Island of Newfoundland” (Bouchard et al. 1991), in: 1984
and 1985 (Gros Morne National Park), 1986 (southwest coast, and the general Port au Port area), 1987 (Great Northern Peninsula), 1988 (Baie Verte Peninsula, Notre Dame Bay, and central and eastern Newfoundland), 1989 (Gros Morne National Park, and the south coast), and 1990 (west coast, and Great Northern Peninsula).

Geographically focused rare plant surveys were conducted by personnel from the Université de Montréal, during the course of the preparation of contracted rare plant reports for Port au Choix National Historic Park (Bouchard et al. 1993), L’Anse aux Meadows National Historic Park (Bouchard et al. 1993), Gros Morne National Park (Anions, 1994; Bouchard et al., 1985, 1986, 1991, 1994, 1996; and Brouillet et al., 1998), and Terra Nova National Park (Brouillet et al. 1997). Additional geographically focused rare plant surveys were conducted in the Squid Cove and Doctors Brook areas, and the Labrador Straits region by C. Hanel (2004, 2005a, 2005b).

Several recent directed attempts to relocate the Table Mountain, Stephenville, population have been made by the Rare Plant Project team (1999), and others, but no plants have been found. Two other directed searches by the Newfoundland Rare Plant Project team found only 12 individuals at William Wheeler Point on July 21, 2000; and no plants at all at nearby Woman Cove on July 22, 2000. Recent efforts to relocate the historical Cape St. George population by the Rare Plant Project team (1991), the personnel from the Université de Montréal during the course of the preparation of the publication “The Rare Vascular Plants of the Island of Newfoundland” (Bouchard et al. 1991), and others, have also been unsuccessful. To date, there have been no recent efforts to relocate the Shag Cliff, Bonne Bay population.

Historical Verified Occurrences/Range Use (recorded prior to the last 25 years)

Table Mountain:

July 26, 1921. Table Mountain, center of south slope of second dome. Dry limestone barrens. [Observers: K. K. Mackenzie, L. Griscom. Collection: Mackenzie 10159. GH (Gray Herbarium); MT (Université de Montréal).]


Cape St. George:


William Wheeler Point:


Woman Cove:

July 8, 1952. Woman Cove (western end of), Middle Arm, Bay of Islands. On the slippery slaty talus slopes. Latitude: 49° 08' 29" Longitude: 58° 80' 25". [Observer: E. Rouleau. Collection: Rouleau 2965. MT (Université de Montréal); NFLD (Agnes Marion Ayre Herbarium of Memorial University).]


Shag Cliff:


Other Observations (unverified occurrences)

None.
Potential Sites Unexplored

Many of the limestone cliffs, screes and taluses of western Newfoundland are relatively inaccessible and have been poorly searched. The limestone barrens of the Port-au-Port Peninsula are extensive and have been relatively poorly searched. More extensive and focused efforts need to be made to try to relocate the remaining historical populations.
Appendix B. Supplementary Details

Taxonomic Clarifications

The taxonomic position of Fernald’s *Carex misandroides* has long been a subject of debate. An historical perspective is provided by Raymond (1952).

The most recent relevant study, by Ball and Zoladz (1994), concluded: [1] that the morphology of *Carex misandroides*, from eastern North America, was not consistently different from that of *Carex petricosa*, from western North America and Asia, [2] that, consequently, the taxon *misandroides* did not merit species status, and should be included within the taxon *petricosa*, [3] that, nevertheless, eastern plants could still be distinguished from western plants, between 80% and 90% of the time, using stigma number (the only useful distinguishing feature) alone, and [4] that, therefore, considering also the several thousand kilometre disjunction between the eastern and western populations, the taxon *misandroides* should still merit varietal status. This reasoning has been generally accepted.

Description

Slender, loosely cespitose sedge. **Culms** to 50 cm tall. **Rhizomes** long and slender. **Leaves:** blades 1-3.5 mm wide. **Inflorescences** 3-12(22) cm; proximal internodes 10-60(100) mm; peduncles of proximal spikes to 8 cm; proximal bracts with blades 5-140 mm; sheaths cylindric, 5-25(35) mm; mouth 0.9-1.5 mm wide. **Spikes** 3-8; lateral spikes androgynous or pistillate (rarely some entirely staminate); proximal spikes inclined or pendent, 5-30 × 3-7 mm; terminal spike staminate or androgynous, 10-28 × 1.8-4 mm. **Pistillate scales** brown to black, oblong-obovate, 3-5.8 × 1.1-2 mm; apex obtuse to acute, sometimes shortly awned. **Staminate scales** brown or black with hyaline margins, oblong-ovate, 3.1-6.2 × 1-3 mm. **Stigmas** mostly 2. **Anthers** 1.5-3 mm. **Perigynia** ascending, pale yellow proximally, brown or black distally, 3-9-veined, lanceolate, 3.5-5.5 × 1.1-2.4 mm, margins ciliate-serrulate distally; apex tapered, shortly setose (sometimes setae confined to veins), or subglabrous; beak indistinct, to 0.5(1) mm. **Achenes** biconvex when there are two stigmas and trigonal when there are three stigmas (Raymond 1952), 1.7-2.2 × 1-1.3 mm. (Modified after Ball and Mastrogiuseppe 2003).


*Carex petricosa* (*sensu lato*) shows considerable variation, even within one clump, in the distribution of staminate and pistillate flowers in the inflorescence. The two taxa here recognized from North America (*var. petricosa* and *var. misandroides*) can usually be distinguished by stigma number (mostly 3 and mostly 2, respectively). However, a small number of individuals must still be determined on purely morphological grounds. (Ball and Zoladz 1994).

**Collections Examined**

Provincial Museum of Newfoundland and Labrador:
NDC 00-424B (NFM 8921) [see Appendix A for details].

Agnes Marion Ayre Herbarium (Memorial University of Newfoundland):
Rouleau 2965 (2 duplicates: NFLD 3675 and 3676) [see Appendix A for details]